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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/592,483	06/09/2000	Robert Cazier	10001921-1	4343

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EXAMINER	
MOE, AUNG SOE	
ART UNIT	**PAPER NUMBER**
2612	

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/592,483	CAZIER ET AL.	
	Examiner	Art Unit	
	Aung S. Moe	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-7,9 and 12-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-7,9 and 12-14* is/are rejected.

7)☒ Claim(s) *15 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-3, 5-7 and 9 have been considered but are moot in view of the new ground(s) of rejection.

2. Applicant's arguments filed on 7/13/2004 have been fully considered but they are not persuasive.

Regarding claims 12-14, the Applicant alleged that Kameshima '880 fails to teach "altering the performance of at least one device associated with said digital imaging device based on said temperature" as recited in the present claimed invention.

In response, the Examiner respectfully disagrees because the combination of Katoh '430 and Kameshima '880 clearly show that the above-mentioned claimed limitations as being well known in the art. For example, Katoh '430 clearly discloses in col. 7, lines 40+ that the performance of the AGC circuit of the digital imaging device is altered based on the temperature changes calculated by the temperature detecting circuit (1411). Moreover, Kameshima '880 teaches that based on the calculated temperature from the first dark current (i.e., see col. 9, lines 15+) signal, the performance of at least one device (i.e., the gate electrode of TFT) of the digital imaging device (i.e., see col. 17, lines 1-10) is altered (i.e., see col. 9, lines 25-45). In view of this, the present claimed limitations of claim 12 is obviously well known over the combination of Katoh '430 and Kameshima '880, thus, the Examiner will maintain the rejection as follows:

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katoh et al. (U.S. 5,796,430) in view of Kameshima et al. (U.S. 6,271,880).

Regarding claim 12, Katoh '430 discloses a method of operating a digital imaging device (i.e., Fig. 14), said method comprising: measuring the first dark current of at lest one photo detector (104) with said digital imaging device (i.e., see col. 7, lines 25- col. 8, lines 15)., and calculating the temperature of said at least one photo detector (i.e., noted that the temperature detecting circuit 141 1 is capable of calculating the temperature of the photo detector 1404; see col. 7, lines 45+); and altering the performance of at least one device associated with the digital imaging device based on the temperature (i.e., col. 7, lines 45 - col. 8, lines 15+ of Katoh '430).

Furthermore, it is noted that Katoh '430 does not explicitly show that the temperature of the photo detector is calculated based on the first dark current measurement as recited present claimed invention.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Knmeshima '880. In particular, Kameshima '880 teaches that it is well known to calculate the temperature of the photo detector (i.e., noted the CMOS sensor having an array of photodiodes as shown in Figs. 13 and 15) based on the first dark current measurement (i.e., see Figs. 13-15, col. 8, line 35 - col. 9, lines 68).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Katoh '430 as taught by Kameshima '880, since Kameshima '880 states at col. 4, lines 2+ that such a modification would provide good S/N ratio and free of influence due to the temperature change.

Regarding claim 14, the combination of Katoh '430 and Kameshima '880 discloses wherein said digital imaging device comprises a shutter (i.e., see Fig. 14, the elements 1402 of Katoh '430), wherein said shutter controls the light received by the at least one photo detector, and wherein said measuring comprises closing said shutter and measuring a first dark current of said at least one photo detector (i.e., see col. 8, lines 65+ of Knmeshima '880).

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katoh '430 in view of Kameshima '880 as applied to claims discussed above, and further in view of Thomas et al. (U.S. 6,525,769).

Regarding claim 13, although the combination of Katoh '430 and Kameshima '880 discloses a fist photo detector of said at least one photo detector for measuring a first dark current of said first photo detector, the combination of Katoh '430 and Knmeshima '880 does not explicitly show that the first photo detector is situated within said digital imaging device so as not to receive light as recite in present claimed invention.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Thomas '769. In particular, Thomas '769 teaches the use of a first photo detector that is situated within the digital imaging device (i.e., noted the sensor 102 as shown in Fig. 1 and 2; see col. 1, lines 15+, col. 3, lines 35+) so as not to receive light, and measuring the first dark current of the first photo detector (i.e., see col. 3, lines 35+ and col. 4, lines 50+).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Katoh '430 as taught by Thomas '769, since Thomas '769 states at col. 2, lines 5+ that such a modification would provide an accurate reduction of dark current errors in the imaging devices.

7. Claims 5, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katoh '430 in view of Bendell et al. (U.S. 4,587,563).

Regarding claim 5, Katoh '430 discloses a method for thermal control of a digital imaging system comprising: measuring the dark current of a photo detector and calculating the temperature of the digital imaging system (i.e., noted the white spot noise correction circuit and the temperature detecting circuit as shown in Fig. 14; also see col. 3, lines 45-68, col. 4, lines 4+ and col. 7, lines 40+).

Furthermore, it is noted that Katoh '430 does not explicitly show that the temperature of the photo detector is calculated based on the measured dark current and controlling the temperature of at least one component in the digital imaging system based on the calculated temperature as recited present claimed invention.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Bendell '563. In particular, Bendell '563 teaches that the temperature of the photo detector can be calculated based on the measured dark current (col. 6, lines 20-25) so that the temperature of at least one component (i.e., the temperature of the cooler 26) of the imaging system can be controlled based on the calculated temperature from the measure dark current (i.e., see col. 4, lines 10-45, and col. 6, lines 30-60).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Katoh '430 as taught by Bendell '563, since Bendell '563 states at col. 2, lines 5+ that such a modification would minimize the power drain without noticeably sacrificing the S/N or black level uniformity performance of the camera.

Regarding claim 7, the combination of Katoh '430 and Bendell '563 discloses the use of a CCD sensor (i.e., noted the Solid State Image sensor 1404 of Katoh '430 and the CCD 12 of Bendell '563).

Regarding claim 9, Katoh '430 discloses the step of measuring the dark current of the photo-sensor (1404) at a known temperature and storing the measured dark current for later use (i.e., noted that the dark currents stored in the memory 1410 are based on the known temperature; see col. 7, lines 45+).

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katoh '430 in view of Bendell '563 as applied to claims discussed above, and further in view of Nobuhiro (Translation of JP 06-062292).

Regarding claim 6, it is noted that although the combination of Katoh '430 and Bendell '563 clearly teaches that the dark current noise of the imaging sensor is due to temperature rise within the imaging device (i.e., col. 7, lines 40+ of Katoh '430 and col. 1, lines 25+ of Bendell '563), the combination of Katoh '430 and Bendell '563 does not explicitly stated that the temperature is control by altering the performance of at least one heat generating component of the digital imaging system.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Nobuhiro '292. In particular, Nobuhiro '292 teaches that the power source of the digital imaging device is a big heat source and generate the dark current in the CCD sensor, thus, it is desirable to altering the performance of heat generating component (i.e., the power source)

of the digital imaging system to control the temperature so that the dark current in CCD is suppressed and the image quality will be improved (i.e., see paragraphs 0003, 0004, 0014-0019).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Katoh '430 as taught by Nobuhiro '292, since Nobuhiro '292 states in the Abstract that such a modification would improve the picture quality of recorded images by preventing heating from being generated in the main body of the camera and the generation of a dark current at a CCD can be suppressed.

9. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katoh '430 in view of Bendell '563 and Nobuhiro (Translation of JP 06-062292).

Regarding claim 1, Katoh '430 discloses a digital imaging system (Fig. 14) comprising; a photo detector (i.e., the solid state image sensor 1404); an analog-to-digital converter to convert the dark current (i.e., col. 4, lines 25-30) output from the photo detector (i.e., noted the A/D converter 1406, and col. 7, lines 25+); a processor (i.e., the element 1407) that measures the electric signal representative of the dark current and control the temperature of the photo detector, based on the dark current measurement (i.e., see col. 7, lines 25- col. 8, lines 15).

Furthermore, it is noted that Katoh '430 does not explicitly show that the temperature of the photo detector is calculated based on the dark current measurement as recited present claimed invention.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Bendell '563. In particular, Bendell '563 teaches that the temperature of the photo detector can be calculated based on the measured dark current (col. 6, lines 20-25) so that the

temperature of at least one component (i.e., the temperature of the cooler 26) of the imaging system can be controlled based on the calculated temperature from the measure dark current (i.e., see col. 4, lines 10-45, and col. 6, lines 30-60).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Katoh '430 as taught by Bendell '563, since Bendell '563 states at col. 2, lines 5+ that such a modification would minimize the power drain without noticeably sacrificing the S/N or black level uniformity performance of the camera.

In addition, it is noted that although the combination of Katoh '430 and Bendell '563 clearly teaches that the dark current noise of the imaging sensor is due to temperature rise within the imaging device (i.e., col. 7, lines 40+ of Katoh '430 and col. 1, lines 25+ of Bendell '563), the combination of Katoh '430 and Bendell '563 does not explicitly stated that the temperature is control by altering the performance of at least one heat generating component of the digital imaging system.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Nobuhiro '292. In particular, Nobuhiro '292 teaches that the power source of the digital imaging device is a big heat source and generate the dark current in the CCD sensor, thus, it is desirable to altering the performance of heat generating component (i.e., the power source) of the digital imaging system to control the temperature so that the dark current in CCD is suppressed and the image quality will be improved (i.e., see paragraphs 0003, 0004, 0014-0019).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Katoh '430 as taught by Nobuhiro '292, since Nobuhiro '292 states in the Abstract that such a modification would improve the picture

quality of recorded images by preventing heating from being generated in the main body of the camera and the generation of a dark current at a CCD can be suppressed.

Regarding claims 2 and 3, the combination of Katoh '430 and Bendell '563 show the use of a CCD/CMOS sensor in the imaging system (i.e., see col. 2, lines 45+ of Bendell '563 and the solid-state image sensor 1404 of Katoh '430.

Allowable Subject Matter

10. Claims 15-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aung S. Moe whose telephone number is 703-306-3021. The examiner can normally be reached on Mon-Fri (9-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 703-305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Aung S. Moe
Primary Examiner
Art Unit 2612

A. Moe
December 7, 2004